LIFE-HISTORY OF PLATYSENTA VIDENS *GUEN.*

BY OTTO SEIFERT.

Southward from Astoria, New York to the railroad and eastward to the little village of Woodside, spreads a pasture-like tract of land, interrupted by sand pits and boggy depressions, the latter being covered a few months in the year by rank vegetation. Every tree and bush of this once wooded region has been removed and almost nothing is left but the sandy soil, covered with a low growth of frugal grasses. Mortified nature, to relieve the monotonous landscape, has compassionately ornamented this desert with some of its hardiest plants. *Euthamia graminifolia*, *E. caroliniana*, different species of *Aster* and *Linaria linaria*, in small fields and patches, cover the ground. Most abundant are the two species of *Euthamia* and, as these are shunned by cattle, their dense yellow flower clusters and emerald green foliage last until late in October. The smaller one, *E. caroliniana*, reaches an average height of twelve inches. The dry, brown stems of the previous season mostly persist, forming with the young shoots (both *Euthamia* are perennial by rootstocks) low, spreading patches. These spots are the favorite habitat of the *Platysenta* larvæ. Here they find a shelter against the parching rays of the sun, protection against rain and a comparatively safe place for their final transformations. The oval cocoons or earth cells are formed in the sandy soil near or on the surface, supported and screened by the superficial roots of the food-plant. Only in a few cases larvæ were found feeding on species of *Solidago*, while hundreds might have been collected without trouble within these patches of *Euthamia*.

The moth of *Platysenta videns* appears in three generations. The first leaves its cocoon late in May, finishing its course of life early in July, while larvæ of the last brood may be found till the middle of October. The caterpillars are most abundant from August till October. They do not feed on the flower clusters, only on the leaves. During the day time they rest on the stems and leaves of the food plant, stretched closely to their resting places, the small, flat head, extended forward and the well-developed anal legs spreading and projecting posteriorly. The normal color of the fully grown larva is the rather pale, dull green of the *Euthamia* leaf, with fine dor-

sal, subdorsal and lateral white lines and a broad white stigmatal band. It would be difficult to detect them were it not for this white band. When disturbed they emit, like many other caterpillars, a yellowish brown or greenish juice. At least 75 per cent. of the larvæ follow this type. Another form is chocolate brown with the same lines. Between these two forms a variety of lighter brown shades to olive green are found. The variety in color has nothing to do with the sex or coloration of the imago, neither does the color protect the larvæ from the attacks of their parasites, as the dark forms are infested in the same proportion as the normal green form.

Of the parasites, *Protomicroplitis calliptera* Say, is most abundant. This and a dipteron, *Winthemia quadripustulata* Fab., may be seen hovering over the blossoms of the food-plant. As the grubs of the parasites leave the caterpillars before the latter form their cells, the little whitish oval cocoons of the *Protomicroplitis* may often be found fastened to the leaves and twigs, though as a rule the grubs bury themselves in the ground deeper than their hosts. *Taniscus geminatus* Say, is a larger, but far rarer parasite infesting them.

The larvæ and pupæ of the moth are hardy and develop easily even when forced by heat, the pupæ of the parasites being more sensitive. The caterpillars do not appear to be much subject to contagious larval diseases—muscardine and flaccidencia—though both diseases are usually most infectious and many larvæ of *Arctia arge*, *Arctia naïs*, *Leucarctia acræa*, *Arsilonche albovenosa*, etc., are killed by the first named disease and found as stiff, whitish corpses on top of grass blades and stems within and around the habitat of the *Platysenta*, while the pretty, adaptive larva of *Cucullia asteroides* feeding frequently on the blossoms of *Solidago* and *Euthamia* are often found affected or destroyed by the latter disease.

The summer-heat quickly develops the moth, the copulation is of short duration and the female at once deposits her eggs singly or not more than six on a leaf. They are not fastened very tightly and may be shaken off by beating.

The larvæ were plentiful in the district alluded to above. Several places in Westchester Co., where *E. graminifolia* grows plentifully (*E. caroliniana* is far more local), were carefully searched for the larvæ, but none were found. Even virgin females exposed there did not find mates. These localities are mostly boggy or rocky. Common as the moth is, it still seems to be confined to certain conditions and

one of these, besides the presence of one of the *Euthamia*, is a light and dry sandy soil, where water can not collect.

May 24th, six females were exposed near Woodside in three different places. Earlier trials with prematurely appearing females had been unsuccessful. A heavy rain set in that night lasting until the following noon; nevertheless early in the morning two of the females were found fertilized, they deposited eggs by degrees until May 27th, when they died.

Egg.—Almost spherical, slightly higher than the widest diameter of 0.5 mm., pale yellowish green. Around the sunken, circular, shallow vertex arise eight equidistant prominent ribs, eight to ten more arise above the middle of the egg, so that at the base sixteen to twenty vertical equally well defined, rather robust ribs pass across the base, eighteen to twenty equidistant striæ cross horizontally, giving the empty eggshell the appearance of being covered with a fine regular network.

The yellowish green color of the egg changes after 36 to 48 hours to a paler green; a purplish brown stripe encircling the middle and a spot of the same color spreading gradually from the vertex; soon the whole upper half is pale purplish brown, the vertical ribs, especially those near the summit, turning transparent and colorless. By June 2d all the eggs had hatched, the young larvæ eating an opening sideways, leave the colorless membrane intact.

Stage I.—Soon after hatching the young larvæ become active, collecting in numbers on the branchlets and at the slightest touch suspend themselves by silken threads. They are slender, about 2.5–3.0 mm. long when resting, slightly widening from the third thoracic segment towards head. Head perceptibly wider than the body, flat, uniformly very light brownish, clypeus paler, ocelli darker brown. Ground color yellowish green, but being almost transparent the contents of the inner organs changes the color to various tints of darker green. The larvæ are geometrid-like, distinctly hunched on eleventh segment; the first two pairs of abdominal legs undeveloped. Tubercles small, black, the single bristles about half as long as the width of the body, also black. Feet concolorous with body. Thoracic feet spread sideways when walking.

Stage II.—(June 7th.) Length of larva about 4.0 mm., width of middle of body 0.5, of head 0.52 mm. Body slightly tapering towards last segment, 11th segment perceptibly hunched. The varia-

bility of the green ground-color, especially on the first five segments and the two last ones, is due to the transparency of the skin and the momentary condition of the intestines. A clear white dorsal line starts from the anterior edge of first segment and reaches to edge of anal shield. In the middle of the space between dorsal line and stigmata, from anterior edge of first to tenth segments where it becomes untraceable, runs a fine subdorsal white line; equidistant from the subdorsal line and stigmata extends a fine white lateral line to edge of anal shield, also commencing from anterior edge of first segment. A broad, prominent white stigmatal band extends to anal legs. Setæ small, arising from very minute points arranged in the usual noctuid manner. (Dyar, Classific. of Lepidopt. Larvæ.) Head very pale tan-colored, flat, shiny, with a few bristles; from vertex; diverging from the summit, run two olive-brown or olive-green stripes, including the whitish clypeus, ending near the upper lip, another similar stripe (subdorsal) terminates near the mandibles and a 3d (lateral) one, wedge-shaped, reaches the base of the antenna.

Stage III.—The larvæ reach a length of 8–9 mm., width of head 0.75 mm., and width of 5th and 6th segment 1.0 mm., tapering slightly towards head and last segment. The second pair of abdominal legs more developed than the first pair. When resting stretched out the larva uses the second pair, holding them vertically while the other normally developed ones are turned sideways, yet often they rest in geometrid-like manner. The larvæ still suspend themselves when disturbed on silken threads and twist almost in a knot.

Head very pale yellowish brown, striped as before but more pronounced. The lower wedge-shaped stripe, including the bow of blackish ocelli, becomes partly broken up by white mottlings. Buccal region whitish, appearing as a continuation of the white stigmatal band. Ground color, band and lines practically as before, the subdorsal line reaching 11th segment, where it gradually vanishes.

Stage IV.—The larva attains an average length of 15 mm., width of middle of body 2.0 mm., width of head 1.0 mm. The looper-like gait is almost entirely abandoned, and as the two first pairs of abdominal legs are not as well developed as the hinder ones, these latter are spread slightly sideways to give the first two pairs a hold on the leaf. Disturbed they do not drop themselves any more on silken threads or curl up knot-like, but try to get upon their feet again as soon as possible.

Head in general as before, the lateral wedge-shaped, brown streak still more reduced by enlarged white mottlings. The green ground-color more intense. The white dorsal line forms on top of the hump a characteristic small white oval spot, often followed on the plant by a still smaller one. The subdorsal line terminates at edge of anal segment. Very frequently the stigmatal cream-white band contains irregularly rose-colored oval spots and above the legs a yellowish, partly-interrupted pedal line is formed. The green color from pedal line to lateral line appears of a brighter green shade than the regions above; this is caused by an accumulation of very minute yellowish white confluent dots and streaks most profuse in the middle of the green spaces between dorsal, subdorsal and lateral lines spreading sideways. Tubercles appear as minute black dots surrounded by small disc-like white spots; setæ small, black and soft. Ventrally uniformly green but of a fainter and duller shade. Stigmata oval, clay-colored with black wing. On first segment the spiracle is only partly enclosed within the white band, on eleventh segment it is situated above the band. Segmental incisures appear as yellow rings when the larva is not outstretched.

Stage V.—The larvæ attain an average length of 18–20 mm. Width of head 1.5 mm., width of middle of body 2.5 mm. All sixteen legs equally well developed; all geometrid-like habits are abandoned.

Head rather flat, dull greenish white, with the brown or dark green streaks as before, the lower wedge-shaped patch dissolved into irregular reticulations. Mouth parts scarcely colored. Antennæ pinkish, tipped with black.

Normally the dorsal line is diminished but distinct and uniform. With many specimens it is interrupted posteriorly on the segments, or appears composed of many irregular small whitish dots and often the line is wanting in front of the oval, white spot on the hump. A rather broad dark green shade attenuated in the middle of each segment seems only to be caused by the action of the dorsal vessel; subdorsal and lateral lines as before. The cream white stigmatal band extends from the buccal region to the extremity of the anal legs. This band is variegated more or less with rose color or deep pinkish in irregular spots, wavy double lines or even by a narrow, irregularly edged central band. The yellowish-green color of dorsal and lateral area is still more changed by irrorations formed by innumerable minute, confluent yellowish-white dots; below lateral line to pedal line these dots are far

less profuse and hence the green color more vivid. Legs concolorous with body, thoracic legs almost translucent, abdominal ones tipped with pink near the feet.

During this period, between fourth and fifth moult, the larvæ commence to appear in different variations; from the most abundant (about 75 %) green form through all shades of olive-green to chocolate brown. The lines, stigmatal band, oval spot on hump, confluent dots and white discs around setæ are permanent. The rose-colored markings of stigmatal band are rarer with the brown varieties. The head varies according to the color of the larva, lighter or darker shades—always lighter than the color of the body; the brown streaks are unaltered. June 17th some of the larvæ passed their fifth moult.

Stage VI.—In about six days they attain their maturity, measuring about 35 mm., width of head 2.15 mm., first segment posteriorly 2.75 mm., third segment posteriorly 4.0 mm., width of eighth segment 4.25 mm. The larva tapers towards head from third thoracic segment; abdomen almost cylindrical, eleventh segment moderately hunched. Head pale green, with a black, narrow, lateral band on each side ending, pointed, between base of antenna and upper lip. On both sides of the black band following this in its extension, the green color is changed to opaque greenish white. Mouth parts sordid whitish, semi-transparent. Ocelli black; base of antenna pale, translucent greenish white, tipped above with rose color, with a brown spot at the joint and dark brown at the end. Below ocelli, continuing from stigmatal band, the buccal region opaque greenish white, often with brownish dash above. Head not entirely smooth; clypeus with fine transverse furrows, the other part of head very minutely shagreened. Setæ scanty, but longer than those on body.

The larvæ grow very rapidly during this period and are subject to much change in the ground color, which at the beginning of this instar is rather vivid yellowish-green, but turns towards maturity to a dull, more bluish green. The dorsal vessel modifies this region by a darker green, obscuring the dorsal line more or less; sub-dorsal and lateral lines mostly indistinct but traceable and always very clear and plain on thoracic segments. Segmental incisures narrowly but distinctly ringed with yellow, but this is only visible when the larva leaves its outstretched position, feeding or moving, and contracts the somites, so that the skin becomes folded and compressed at the sutures. Stigmata pale ochre with black rim. From head to anal legs extends a broad

cream white band. On first and eleventh segment the spiracles only touching its upper margin and on eighth and ninth they are situated only partly within the band. Often a narrow brown or purplish line borders the white band above; sometimes this line is interrupted or only indicated by a dash on first segment; in most cases it encloses a narrow rose colored, irrorated band with darker red edges; this red band may be interrupted and often is scarcely indicated or wanting entirely.

The green color above and below is mottled with innumerable more or less distinct, yellowish white dots and streaks, most plentiful between dorsal and lateral lines where they become confluent, forming mecandric and tortuous designs. On top of hump on 11th segment an oval, yellowish white spot, often pinkish inside, sometimes a still smaller one below on the slant.

Setæ very small and weak arising from white disk-like tubercles, a still more anterior white disk than; does not bear bristle. Ventrally and subventrally the green color is more intense than above. Fore-legs greenish but pale; abdominal legs green with minute whitish dots, feet tipped with rose color or pink.

The dark varieties occur in all shades from olive brown and purplish to paler or darker chocolate brown. Markings the same as in the normal green form. The stigmatal band mostly plain, but specimens banded or variegated with rose color are not scarce. The white lines are shaded more or less above and below with a darker tint of ground color.

The head of the dark varieties has the same color but paler than the body, the black bands are the same, the space below the black band and white buccal region is often marked by dark brown dashes or reticulations. June 14th sixty larvæ, all green with striped heads and as far as possible before 5th moult were separately reared in a roomy glass jar, containing an abundance of the dry last year's stems and branchlets of the food plant and dried-up, brownish leaves, only few fresh plants being added, for food, so that the caterpillars had almost no other resting place but the dry plant; the jar was kept in a light though shady place. June 25th they were examined. Five had formed their cells and hence the color could not be ascertained, thirty-nine were of the brown variety in different shades and sixteen only were of the normal green form.

Before pupating the larva turns purplish and, usually at night, forms

on or near the surface of the pround an oval, brittle cell of sand and earth in which it transforms to a pupa within a few hours.

The moderately stout pupa is of a light chestnut brown; head, thorax, wing and limb cases darker brown, finely rugose; movable segments finely punctured anteriorly with darker brown edge near sutures, spiracles also darker brown. The pupa ends in two spines about 0.7 mm. in length and is not fastened to the cocoon. Thorax slightly compressed sideways. Length of earth-cell 15–17 mm., width in the middle 10 mm. Length of pupa 12–13 mm., width of 3d abdominal segment, where the pupa is widest, 4.0–4.5 mm.

First imagines of these broods appeared July 6th, the majority from July 9th to July 12th.

The plain color and design of *Platysenta videns* precludes marked variation. The large material obtained by breeding shows fairly the range of variation. The moths from wintering pupæ expand 27–32.5 mm.; those of the early summer brood 25–33 mm. The summer form is throughout of a decidedly darker ground color of primaries than the preceding one, even the fringe being often uniformly blackish. The secondaries, which in the fall brood are in some cases even plain whitish, show a tendency to form a more or less broad, sooty, marginal band, sometimes shading beyond the middle. This tendency to melanism in one brood is caused apparently by the favorable temperature and the excellent physiological condition of the food-plant, which combined produce more vigorous individuals than in the brood growing up in the fall, exposed to a waning food-plant and frequently to the vicissitudes of the weather.

DESCRIPTIONS OF SOME PYRALID LARVÆ FROM SOUTHERN FLORIDA.

By HARRISON G. DYAR.

Margaronia bivitralis *Guen.**

Larva. Head rounded, whitish green, ocelli black. Body slender, uniform, segments 2-annulate, setæ moderate. Transparent, the blood green, food dark green.

* I learn from Prof. C. H. Fernald that the synonymy as given in the Smith list and by Hampson is erroneous and that this species should be called *Glyphodes sibillalis* Walk. = *batesi* Feld = *alitalis* Hulst (nec. *bivitralis* Guen.).